

Biomimetic Approach for Accurate, Real-Time Aerodynamic Coefficients, Phase I

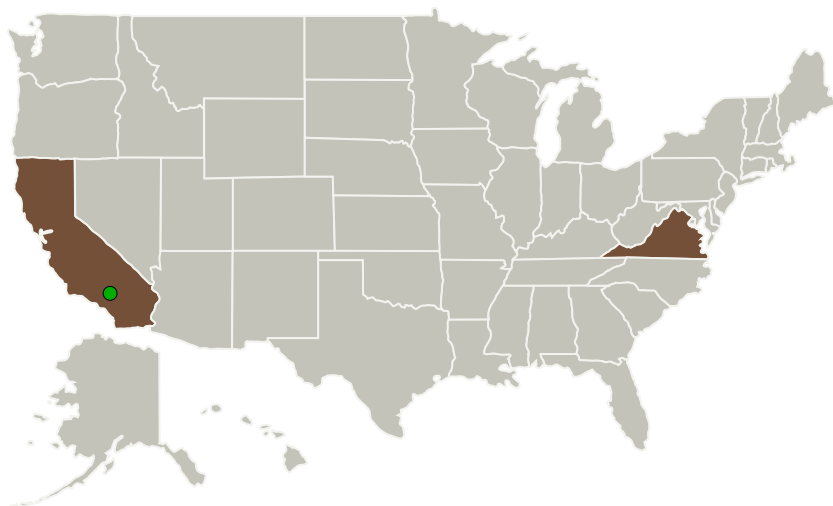
Completed Technology Project (2011 - 2011)



Project Introduction

Aerodynamic and structural reliability and efficiency depends critically on the ability to accurately assess the aerodynamic loads and moments for each lifting surface. A thin-film, flight-worthy sensor capable of providing spatio-temporally accurate estimation of aerodynamic coefficients enables revolutionary energy-efficient, physics-based, force-feedback flight control of a wide range of vehicles from subsonic to supersonic flows. Recent biophysics research has uncovered sensory techniques to recover information from the noisy environment. Tao Systems proposes to develop a unique sensor that robustly applies these biomimetic sensory techniques to the aerodynamic problem to obtain accurate estimates of aerodynamic coefficients with minimal calibration requirements.

Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
Tao of Systems Integration, Inc.	Lead Organization	Industry Minority-Owned Business, Small Disadvantaged Business (SDB)	Hampton, Virginia
● Armstrong Flight Research Center(AFRC)	Supporting Organization	NASA Center	Edwards, California



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Primary U.S. Work Locations

California

Virginia

Project Transitions

 **February 2011:** Project Start

 **September 2011:** Closed out

Closeout Documentation:

- Final Summary Chart(<https://techport.nasa.gov/file/138019>)

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Tao of Systems Integration, Inc.

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

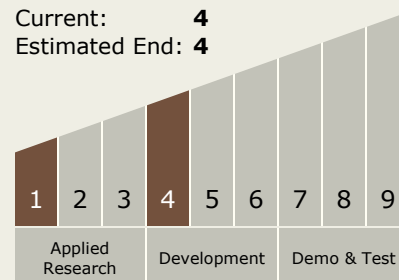
Carlos Torrez

Principal Investigator:

Arun Mangalam

Technology Maturity (TRL)

Start: **1**
Current: **4**
Estimated End: **4**



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Technology Areas

Primary:

- TX15 Flight Vehicle Systems
 - └ TX15.1 Aerosciences
 - └ TX15.1.1 Aerodynamics

Target Destinations

The Moon, Mars, Outside the Solar System, The Sun, Earth, Others Inside the Solar System